

IN THE CLAIMS

Claims 29, 30, 36-49, 51-54 and 58-59 are amended, not canceled and no claims are added herein. The currently-pending claims, along with their status identifiers, are provided below.

1. (Withdrawn) A method, comprising:
recording data related to a status of a prescribed cardiac resynchronization therapy (CRT) in a cardiac rhythm management (CRM) device;
processing the data into trended data useful for assessing the status of the prescribed CRT; and
presenting the trended data for use to assess the status of the prescribed CRT.
2. (Withdrawn) The method of claim 1, wherein recording data related to a status of a prescribed CRT in a CRM device includes recording realized CRT data.
3. (Withdrawn) The method of claim 2, wherein recording realized CRT data includes recording a value corresponding to CRT delivery, the value being at least one from the group consisting of a percentage value and an absolute value.
4. (Withdrawn) The method of claim 2, wherein recording realized CRT data includes recording a value corresponding to ventricular pacing, the value being at least one from the group consisting of a percentage value and an absolute value, the ventricular pacing being at least one from a group consisting of right ventricular pacing (RV PACE) and left ventricular pacing (LV PACE).
5. (Withdrawn) The method of claim 2, wherein recording realized CRT data includes recording a value corresponding to atrial tachycardia (AT), the value being at least one from the group consisting of a percentage value and an absolute value.

6. (Withdrawn) The method of claim 2, wherein recording realized CRT data includes recording a value corresponding to capture, the value being at least one value from the group of values consisting of a percentage value and an absolute value.
7. (Withdrawn) The method of claim 2, wherein recording realized CRT data includes recording a value corresponding to a value above a programmed rate, the value being at least one from the group consisting of a percentage value and an absolute value, the programmed rate being at least one from the group consisting of a programmed maximum tracking rate (MTR), a programmed maximum sensing rate (MSR), and a programmed maximum pacing rate (MPR).
8. (Withdrawn) The method of claim 2, wherein recording realized CRT data includes recording a value corresponding to a mode of operation, the value being at least one from the group consisting of a percentage value and an absolute value, the mode being at least one from the group consisting of a tracking mode (TT) of operation and a non-tracking mode (TN) of operation.
9. (Withdrawn) The method of claim 2, wherein recording realized CRT data includes recording a value corresponding to a CRT delivery results, the value being at least one from the group consisting of a percentage value and an absolute value, the CRT delivery results being at least one from the group consisting of CRT therapy that was successfully delivered (TTCRT) and CRT therapy that was not successfully delivered (TNCRT).
10. (Withdrawn) The method of claim 1, wherein recording data related to a status of a prescribed CRT in a CRM device includes recording prescribed CRT data corresponding to programmed CRT-related parameters.
11. (Withdrawn) The method of claim 1, wherein recording data related to a status of a prescribed CRT in a CRM device includes recording a CRM device operating mode.

12. (Withdrawn) The method of claim 11, wherein recording a CRM device operating mode includes recording data to permit association between recorded data and a pacing mode of the CRM device when the data is recorded.
13. (Withdrawn) The method of claim 1, wherein recording data related to a status of a prescribed CRT in a CRM device includes recording other CRM device data capable of affecting the status of the prescribed CRT in the CRM device.
14. (Withdrawn) The method of claim 1, wherein recording data related to a status of a prescribed CRT in a CRM device includes recording a time associated with recording at least one of realized CRT data, prescribed CRT data, and a CRM device operating mode.
15. (Withdrawn) The method of claim 1, wherein processing the data into trended data useful for assessing the status of the prescribed CRT includes processing the trended data for displaying a representation of the trended data.
16. (Withdrawn) The method of claim 1, wherein processing the data into trended data useful for assessing the status of the prescribed CRT includes executing an algorithm on the data to assist with assessing the status of the CRT.
17. (Withdrawn) The method of claim 1, further comprising using the status of the prescribed CRT to assist with determining an adjustment to improve the prescribed CRT.
18. (Withdrawn) The method of claim 17, wherein presenting the trended data for use to assess the status of the prescribed CRT includes displaying graphs of the trended data.
19. (Withdrawn) The method of claim 17, wherein presenting the trended data for use to assess the status of the prescribed CRT includes displaying a table containing the trended data.

20. (Withdrawn) The method of claim 17, wherein presenting the trended data for use to assess the status of the prescribed CRT includes providing an alert corresponding to the status of the prescribed CRT.
21. (Withdrawn) The method of claim 1, wherein the status of the prescribed CRT includes a chronic, ambulatory status.
22. (Withdrawn) The method of claim 1, further comprising initiating a trigger, wherein data related to the status of the prescribed CRT in the CRM device is recorded after initiating the trigger.
23. (Withdrawn) The method of claim 1, wherein processing the data into trended data includes trending N samples per unit time.
24. (Withdrawn) The method of claim 1, wherein processing the data into trended data includes trending N samples per unit time until a predetermined change occurs in delivered CRT, and then trending M samples per unit time.
25. (Withdrawn) The method of claim 1, wherein processing the data into trended data includes trending N samples per unit time until a predetermined threshold is reached related to delivered CRT, and then trending M samples per unit time.
26. (Withdrawn) The method of claim 1, wherein processing the data into trended data includes trending N samples per unit time until a predetermined event occurs, and then trending M samples per unit time.

27. (Withdrawn) The method of claim 1, wherein processing the data into trended data includes trending M samples per unit time after initiation of a trigger selected from a group consisting of: a predetermined change in delivered CRT, a predetermined threshold related to delivered CRT, and a predetermined event.

28. (Withdrawn) The method of claim 1, wherein processing the data into trended data includes:

trending a first parameter before a trigger selected from a group consisting of a predetermined change in delivered CRT, a predetermined threshold related to delivered CRT, and a predetermined event; and

trending a second parameter after the trigger.

29. (Currently Amended) An implantable cardiac rhythm management (CRM) device, comprising:

a plurality of interface channels adapted to interface with a plurality of electrodes on at least one lead, wherein the plurality of interface channels are adapted to deliver pacing pulses to at least one of the plurality of electrodes and to receive sensed cardiac signals from at least one of the plurality of electrodes as part of a prescribed cardiac resynchronization therapy (CRT);

a memory embedded with computer instructions;

a controller adapted to communicate with the plurality of interface channels and with the memory, the controller adapted to control the prescribed CRT to improve coordination of ventricular contraction, the prescribed CRT including pacing a left ventricle cardiac site at a predetermined time interval with respect to a cardiac event at a second cardiac site, the cardiac event including a paced cardiac event at the second cardiac site or a sensed intrinsic cardiac event at the second cardiac site, the controller being adapted to control delivery of the pacing pulses, to ~~process~~ processing of the sensed signals, and recording of ~~to record~~ CRT-related data ~~relevant to a status of the prescribed CRT to the memory, the data including data indicative of whether the left ventricle cardiac site was paced at the predetermined time interval with respect to the cardiac event at the second cardiac site; and~~

a communication circuit adapted to transmit the ~~CRT-related~~ recorded data to an external device for presentation of data trends useful to assess ~~the status~~ an efficacy of the prescribed CRT, wherein the data trends include at least one ~~CRT-related~~ data parameter associated with time.

30. (Currently Amended) The device of claim 29, wherein the data ~~relevant to a status of the prescribed CRT~~ includes a chronic, ambulatory data.

31. (Original) The device of claim 29, wherein the plurality of interface channels include:
a right ventricle (RV) interface channel for use in sensing and pacing a right ventricle of a heart;
a left ventricle (LV) interface channel for use in sensing and pacing a left ventricle of a heart; and
a right atrium (RA) interface channel for use in sensing and pacing an atrium of the heart.

32. (Original) The device of claim 29, wherein the controller is adapted to record prescribed CRT data and time information in the memory.

33. (Original) The device of claim 29, wherein the controller is adapted to record realized CRT data and time information in the memory.

34. (Original) The device of claim 29, wherein the controller is adapted to record a pacing mode and time information in the memory.

35. (Original) The device of claim 34, wherein the controller is adapted to record when the device is operating in an atrial tracking mode to the memory.

36. (Currently Amended) The device of claim 29, wherein the controller is adapted to trend samples of CRT-related data indicative of whether the left ventricle cardiac site was paced at the predetermined time interval with respect to the cardiac event at the second cardiac site relevant to the status of the prescribed CRT to the memory, including to trend N samples per unit time.

37. (Currently Amended) The device of claim 29, wherein the controller is adapted to trend samples of CRT-related data indicative of whether the left ventricle cardiac site was paced at the predetermined time interval with respect to the cardiac event at the second cardiac site relevant to the status of the prescribed CRT to the memory, including to trend N samples per unit time until a predetermined change occurs in delivered CRT, and then trend M samples per unit time.

38. (Currently Amended) The device of claim 29, wherein the controller is adapted to trend samples of CRT-related data indicative of whether the left ventricle cardiac site was paced at the predetermined time interval with respect to the cardiac event at the second cardiac site relevant to the status of the prescribed CRT to the memory, including to trend N samples per unit time until a predetermined threshold is reached related to delivered CRT, and then trend M samples per unit time.

39. (Currently Amended) The device of claim 29, wherein the controller is adapted to trend samples of CRT-related data indicative of whether the left ventricle cardiac site was paced at the predetermined time interval with respect to the cardiac event at the second cardiac site relevant to the status of the prescribed CRT to the memory, including to trend N samples per unit time until a predetermined event occurs, and then trend M samples per unit time.

40. (Currently Amended) The device of claim 29, wherein the controller is adapted to trend samples of CRT-related data indicative of whether the left ventricle cardiac site was paced at the predetermined time interval with respect to the cardiac event at the second cardiac site relevant to the status of the prescribed CRT to the memory, including to trend M samples per unit time after initiation of a trigger selected from a group consisting of: a predetermined change in delivered CRT, a predetermined threshold related to delivered CRT, and a predetermined event.

41. (Currently Amended) The device of claim 29, wherein the controller is adapted to trend samples of ~~CRT-related~~ data indicative of whether the left ventricle cardiac site was paced at the predetermined time interval with respect to the cardiac event at the second cardiac site relevant to the status of the prescribed CRT to the memory, including to trend a first parameter before a trigger selected from a group consisting of a predetermined change in delivered CRT, a predetermined threshold related to delivered CRT, and a predetermined event, and to trend a second parameter after the trigger.

42. (Currently Amended) The device of claim 41, wherein the ~~CRT-related~~ data includes a value corresponding to CRT delivery, the value being at least one from the group consisting of a percentage value and an absolute value.

43. (Currently Amended) The device of claim 41, wherein the ~~CRT-related~~ data includes a value corresponding to ventricular pacing, the value being at least one from the group consisting of a percentage value and an absolute value, the ventricular pacing being at least one from a group consisting of right ventricular pacing (RV PACE) and left ventricular pacing (LV PACE).

44. (Currently Amended) The device of claim 41, wherein the ~~CRT-related~~ data includes a value corresponding to atrial tachycardia (AT), the value being at least one from the group consisting of a percentage value and an absolute value.

45. (Currently Amended) The device of claim 41, wherein the ~~CRT-related~~ data includes a value corresponding to capture, the value being at least one value from the group of values consisting of a percentage value and an absolute value.

46. (Currently Amended) The device of claim 41, wherein the ~~CRT-related~~ data includes a value corresponding to a value above a programmed rate, the value being at least one from the group consisting of a percentage value and an absolute value, the programmed rate being at least one from the group consisting of a programmed maximum tracking rate (MTR), a programmed maximum sensing rate (MSR), and a programmed maximum pacing rate (MPR).

47. (Currently Amended) The device of claim 41, wherein the ~~CRT-related~~ data includes a value corresponding to a mode of operation, the value being at least one from the group consisting of a percentage value and an absolute value, the mode being at least one from the group consisting of a tracking mode (TT) of operation and a non-tracking mode (TN) of operation.

48. (Currently Amended) The device of claim 41, wherein the ~~CRT-related~~ data includes a value corresponding to a CRT delivery results, the value being at least one from the group consisting of a percentage value and an absolute value, the CRT delivery results being at least one from the group consisting of CRT therapy that was successfully delivered (TTCRT) and CRT therapy that was not successfully delivered (TNCRT).

49. (Currently Amended) A system, comprising:

an implantable cardiac rhythm (CRM) device adapted to perform a prescribed cardiac resynchronization therapy (CRT) to improve coordination of ventricular contraction, the prescribed CRT including pacing a left ventricle cardiac site at a predetermined time interval with respect to a cardiac event at a second cardiac site, the cardiac event including a paced cardiac event at the second cardiac site or a sensed intrinsic cardiac event at the second cardiac site, the CRM device including:

a set of interface channels adapted to provide the prescribed ~~CRT eardiac~~
~~resynchronization therapy (CRT)~~, wherein at least one of the channels is adapted to deliver pacing pulses to at least one of a plurality of electrodes and at least one of the channels is adapted to receive sensed cardiac signals from at least one of the plurality of electrodes;

a memory embedded with controller instructions;

a controller adapted to communicate with the set of interface channels and the memory, the controller adapted to execute the controller instructions to control delivery of the pacing pulses, to process sensed cardiac signals, and to record CRT-related data ~~relevant to a status of the prescribed CRT~~ to the memory of the CRM device, the data including data indicative of whether the left ventricle cardiac site was paced at the predetermined time interval with respect to the cardiac event at the second cardiac site; and

a communication circuit adapted to communicate with the controller and to transmit and receive wireless communication signals; and

a programmer adapted to program the CRM device to provide the prescribed CRT, the programmer including:

a memory embedded with controller instructions;

a controller adapted to communicate with the memory and execute the controller instructions;

a communication circuit adapted to communicate with the controller and to transmit and receive wireless communication signals such that the programmer is capable of wirelessly communicating with the CRM device, and such that the CRT-related data is communicated from the memory of the CRM device to the memory of the programmer; and

a monitor adapted to communicate with the controller, wherein at least one of the programmer and the CRM device is adapted to trend the CRT-related data, the monitor being adapted to display information corresponding to the trended CRT-related data indicative of whether the left ventricle cardiac site was paced at the predetermined time interval with respect to the cardiac event at the second cardiac site ~~the status of the prescribed CRT~~, wherein the trended CRT-related data include at least one CRT-related data parameter associated with time.

50. (Original) The system of claim 49, wherein the status of the prescribed CRT includes a chronic, ambulatory status.

51. (Currently Amended) The system of claim 49, wherein the memory of the CRM device includes controller instructions to be executed by the controller of the CRM device to trend the data ~~samples~~.

52. (Currently Amended) The system of claim 49, wherein the memory of the programmer includes controller instructions to be executed by the controller of the programmer to trend the data ~~samples~~.

53. (Currently Amended) The system of claim 49, wherein the information displayed on the monitor includes at least one of:

- a graph of the trended data ~~samples~~;
- a table containing the trended data ~~samples~~; and
- an alert corresponding to the status of the prescribed CRT.

54. (Currently Amended) A system, comprising:

an implantable cardiac rhythm (CRM) device adapted to perform a prescribed cardiac resynchronization therapy (CRT) to improve coordination of ventricular contraction, the prescribed CRT including pacing a left ventricle cardiac site at a predetermined time interval with respect to a cardiac event at a second cardiac site, the cardiac event including a paced cardiac event at the second cardiac site or a sensed intrinsic cardiac event at the second cardiac site, the CRM device including:

- means for delivering pacing pulses to at least one of a plurality of electrodes;
- means for receiving sensed cardiac signals from at least one of the plurality of electrodes;
- means for controlling delivery of the pacing pulses and processing the sensed cardiac signals to perform the prescribed CRT;

means for recording ~~CRT-related~~ data corresponding to a status of the prescribed CRT, the data including data indicative of whether the left ventricle cardiac site was paced at the predetermined time interval with respect to the cardiac event at the second cardiac site; and

means for transmitting and receiving wireless communication signals; and
a programmer adapted to program the CRM device to provide the prescribed CRT, wherein at least one of the programmer and the CRM device is adapted to trend the ~~CRT-related~~ data, the programmer including:

means for transmitting and receiving wireless communication signals such that the programmer is capable of wirelessly communicating with the CRM device; and

means for displaying information corresponding to the trended ~~CRT-related~~ data indicative of whether the left ventricle cardiac site was paced at the predetermined time interval with respect to the cardiac event at the second cardiac site ~~the status of the prescribed CRT~~, wherein the trended ~~CRT-related~~ data include at least one ~~CRT-related~~ data parameter associated with time.

55. (Original) The system of claim 54, wherein the status of the prescribed CRT includes a chronic, ambulatory status of the prescribed CRT.

56. (Previously Presented) The system of claim 54, wherein the means for displaying information includes a graph of the trended data.

57. (Previously Presented) The system of claim 54, wherein the means for displaying information includes a table of the trended data.

58. (Currently Amended) The system of claim 54, wherein the ~~CRT-related~~ data includes prescribed CRT data.

59. (Currently Amended) The system of claim 54, wherein the ~~CRT-related~~ data includes realized CRT data.

60. (Previously Presented) The system of claim 54, wherein the CRM device further includes means for detecting a trigger, and means for trending data samples based on the trigger.